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**INVESTIGATIONS OF MEDIUM WAVELENGTH MAGNETIC  
ANOMALIES IN THE EASTERN PACIFIC USING MAGSAT  
DATA**

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## INVESTIGATIONS OF MEDIUM WAVELENGTH MAGNETIC ANOMALIES IN THE EASTERN PACIFIC USING MAGSAT DATA

During the first part of the quarter, processing continued on the data set covering the first three months of the mission. The data tapes containing this information were known to have processing errors which were circumvented as best as possible.

The first step in the processing of a data tape involves a screening program which selects orbits over a specified range of longitude and latitude. Orbits which fall within the geographical boundaries are saved on disk and a listing is produced containing complete orbital information as contained in the header block. In addition, a short data listing for the orbit is produced composed of selected values from the first record of each data block.

Once the orbital data have been stored on disk, processing proceeds to the plotting stage in order to verify the quality of the data. For each orbit three plots are produced:

1. ALTITUDE vs LATITUDE: This plot allows us to determine if adjacent orbits can be compared on the basis of height above the sources.
2. ANOMALOUS FIELD vs LATITUDE:
3. CORRECTED ANOMALOUS FIELD vs LATITUDE: The anomalous field as corrected for ring current effects using coefficients supplied on the data tape. It is known that the external field is highly variable and this correction was an attempt to increase the correlation between adjacent orbits.

The results of the plotting segment showed the following:

1. The data from the first day of the mission are not usable as they are extremely noisy.
2. Some orbits contained spikes, no doubt a processing error on the data tape.

3. Some orbits contained a 20° region in latitude, offset roughly 30 nT from the rest of the anomalous field profile; probably a processing error.

4. The correlation between adjacent orbits is poor, not even the ring current correction improves matters.

The lack of correlation between anomalous field profiles of adjacent orbits was expected due to the highly variable nature of external sources. The fact that the ring current correction failed to increase correlations is probably related to the fact that the MAGSAT spherical harmonic model (680) used in calculating the ring coefficients was biased by seasonal ionospheric currents and that a processing error might have resulted in using incorrect values for the modelled vector components of the field.

Toward the end of the quarter a corrected set of data tapes covering the first three months were received. These tapes were processed in the same manner as the first set and the results compared. Obvious errors like points 2 and 3 mentioned above were corrected, however; even though new ring current coefficients were provided the desired correlations did not materialize, indicating further corrections must be devised.